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$7=1+6=2+5=3+4=4+3=5+2=6+1$; hence the chance against throwing 7 at one throw is $1-\frac{6}{36}=\frac{5}{6}$.

Hence, the chance against throwing either 7 or 11 is $1-(\frac{1}{18}+\frac{1}{6})=\frac{7}{9}$.

II. Solution by J. SCHEFFER, A. M., Hagerstown, Md.

The chance of throwing 7 with two dice is $\frac{6}{36}=\frac{1}{6}$, and that of throwing 11 is $\frac{2}{36}=\frac{1}{18}$; therefore, the chance of throwing either 7 or 11 is $\frac{1}{6}+\frac{1}{18}=\frac{2}{9}$.

$\therefore$ the odds against this event$=7:2$.

III. Solution by WALTER H. DRANE, Graduate Student, Harvard University, Cambridge, Mass.

The combinations which give 7 or 11 with two dice are four in number, viz.: $6+1$, $5+2$, $4+3$, and $6+5$.

The total number of combinations is 36. Hence the chance of throwing either a 7 or 11 at one throw is $\frac{4}{36}=\frac{1}{9}$. Hence the odds are 8 to 1 against the event.

IV. Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Mathematics and Science, Chester High School, Chester, Pa.

7 can be thrown 6 ways at one throw with two dice, as follows:

6 and 1, 1 and 6, 5 and 2, 2 and 5, 4 and 3, 3 and 4.

$\therefore$ chance of throwing 7 is $\frac{6}{36}=\frac{1}{6}$.

$\therefore$ the odds are 5 to 1 against the event.

11 can be thrown 2 ways, as follows: 6 and 5, and 5 and 6.

$\therefore$ chance of throwing 11 is $\frac{2}{36}=\frac{1}{18}$.

$\therefore$ the odds are 17 to 1 against the event.

7 is the most likely throw of all at one time with two dice.

V. Solution by ELMER SCHUYLER, Annapolis, Md.

$7=1+6=2+5=3+4$, each occuring in two ways.

$\therefore$ 7 can occur in six ways.

$11=5+6$, can occur in 2 ways.

$\therefore$ 7 and 11 can occur in eight ways.

$\therefore$ $\frac{8}{36}=\frac{2}{9}=$probability in favor of the event.

$\therefore$ the odds are 7 to 2.

69. Proposed by Rev. W. ALLEN WHITWORTH, M. A.

There are n equal sugar sticks. Each stick is broken into two pieces, all positions of the fracture being equally likely. Of the two n pieces thus formed, a child is to take the largest. Show that his expectation is $[2n+1]/[2(n+1)]$ of a stick. [From *The Educational Times*, June, 1898.]

Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Mathematics and Science, Chester High School, Chester, Pa.

Let each stick be of unit length. Then since there are $2n$ pieces, and each piece can have any length from zero to unity, we have for the required expectation: